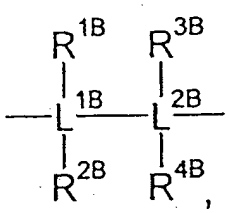
We claim:

1. (original) A monocyclopentadienyl complex which contains the structural feature of the formula $(Cp)(-Z-A)_mM$ (I), where the variables have the following meanings:

Cp is a cyclopentadienyl system,

Z is a bridge between A and Cp and is selected from the group consisting of



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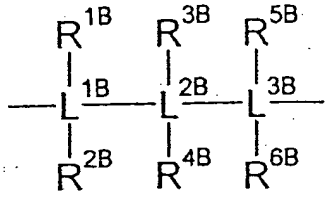

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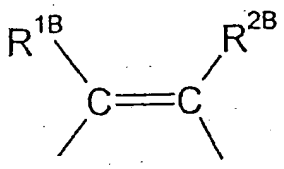


,

where

L^{1B}-L^{3B} are each, independently of one another, carbon or silicon,

R^{1B}-R^{6B} are each, independently of one another, hydrogen, C_1-C_{20}-alkyl, C_2-C_{20}-alkenyl, C_6-C_{20}-aryl, alkylaryl having from 1 to 10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part or SiR^{7B}_3, where the organic radicals R^{1B}-R^{6B} may also be substituted by halogens and two geminal or vicinal radicals R^{1B}-R^{6B} or a radical R^{1B}-R^{6B} and A may also be joined to form a five- or six-membered ring and

R^{7B} are each, independently of one another, hydrogen, C_1-C_{20}-alkyl, C_2-C_{20}-alkenyl, C_6-C_{20}-aryl or alkylaryl having from 1 to 10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part and two radicals R^{7B} may also be joined to form a five- or six-membered ring,

A is an unsubstituted, substituted or fused, heteroaromatic ring system,

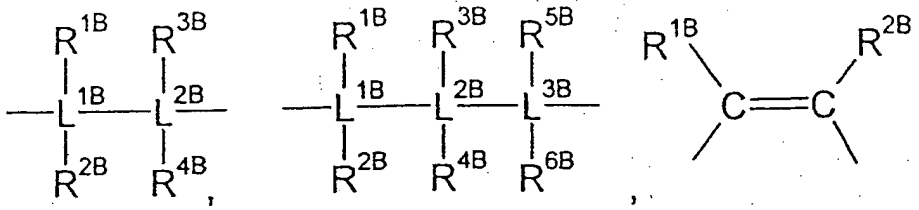
M is a metal selected from the group consisting of titanium in the oxidation state 3, vanadium, chromium, molybdenum and tungsten and

m is 1, 2 or 3.

2. (original) A monocyclopentadienyl complex as claimed in claim 1 of the formula $(Cp)(-Z-A)_mMX_k$ (V), where the variables have the following meanings:

Cp is a cyclopentadienyl system,

Z is a bridge between A and Cp and is selected from the group consisting of



where

L^{1B}-L^{3B} are each, independently of one another, carbon or silicon,

R^{1B}-R^{6B} are each, independently of one another, hydrogen, C_1-C_{20}-alkyl, C_2-C_{20}-alkenyl, C_6-C_{20}-aryl, alkylaryl having from 1 to 10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part or SiR^{7B}_3, where the organic radicals R^{1B}-R^{6B} may also be substituted by halogens and two geminal or vicinal radicals R^{1B}-R^{6B} may also be joined to form a five- or six-membered ring and

R^{7B} are each, independently of one another, hydrogen, C_1-C_{20}-alkyl, C_2-C_{20}-alkenyl, C_6-C_{20}-aryl or alkylaryl having from 1 to 10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part and two radicals R^{7B} may also be joined to form a five- or six-membered ring,

A is an unsubstituted, substituted or fused, heteroaromatic ring system,

M is a metal selected from the group consisting of titanium in the oxidation state 3, chromium, molybdenum and tungsten,

m is 1, 2 or 3,

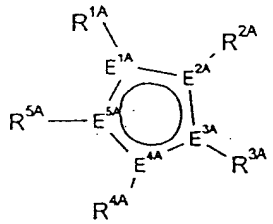
X are each, independently of one another, fluorine, chlorine, bromine, iodine, hydrogen, C_1-C_{10}-alkyl, C_2-C_{10}-alkenyl, C_6-C_{20}-aryl, alkylaryl having 1-10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part, NR^1R^2, OR^1, SR^1, SO_3R^1, $OC(O)R^1$, CN, SCN, β-diketonate, CO, BF_4^-, PF_6^- or a bulky noncoordinating anion,

R^1-R^2 are each, independently of one another, hydrogen, C_1-C_{20}-alkyl, C_2-C_{20}-alkenyl, C_6-C_{20}-alkenyl, C_6-C_{20}-aryl, alkylaryl having from 1 to 10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part, SiR^3_3, where the organic radicals R^1-R^2 may also be substituted by halogens and two radicals R^1-R^2 may also be joined to form a five- or six-membered ring,

R^3 are each, independently of one another, hydrogen, C_1-C_{20}-alkyl, C_2-C_{20}-alkenyl, C_6-C_{20}-aryl, alkylaryl having from 1 to 10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part and two radicals R^3 may also be joined to form a five- or six-membered ring and

k is 1, 2 or 3.

3. (currently amended) A monocyclopentadienyl complex as claimed in claim 1 ~~or 2~~, wherein the cyclopentadienyl system Cp has the formula (II):



(II)

where the variables have the following meanings:

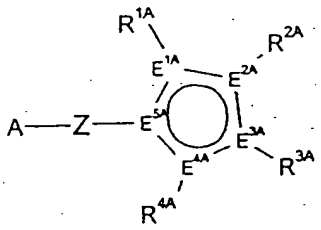
E^{1A}-E^{5A} are each carbon or not more than one E^{1A} to E^{5A} is phosphorus,

R^{1A}-R^{5A} are each, independently of one another, hydrogen, C_1-C_{20}-alkyl, C_2-C_{20}-alkenyl, C_6-C_{20}-aryl, alkylaryl having from 1 to 10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part, NR^{6A}_2, $N(SiR^{6A}_3)_2$, OR^{6A}, $OSiR^{6A}_3$, SiR^{6A}_3, BR^{6A}_2, where the organic radicals R^{1A}-R^{5A} may also be substituted by halogens and two vicinal radicals R^{1A}-R^{5A} may also be joined to form a five- or six-membered ring, and/or two vicinal radicals R^{1A}-R^{5A} are joined to form a heterocycle which contains at least one atom from the group consisting of N, P, O and S, and where 1, 2 or 3 substituents R^{1A}-R^{5A} is a group -Z-A and

R^{6A} are each, independently of one another, hydrogen, C_1-C_{20}-alkyl, C_2-C_{20}-alkenyl, C_6-C_{20}-aryl, alkylaryl having from 1 to 10 carbon atoms in the alkyl radical and 6-20 carbon atoms in the aryl radical and two geminal radicals R^{6A} may also be joined to form a five- or six-membered

ring.

4. (currently amended) A monocyclopentadienyl complex as claimed in ~~any of claims~~ claim 1 ~~or 3~~, wherein



(IV)

where the variables have the following meanings:

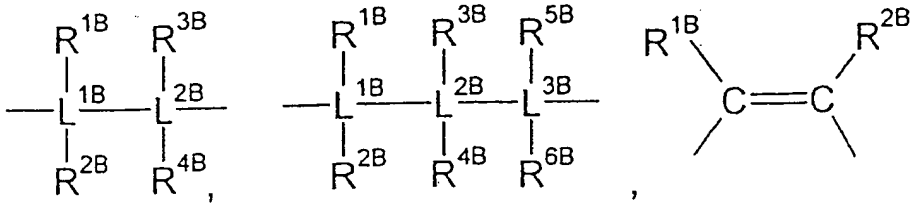
E^{1A}-E^{5A} are each carbon or at most one E^{1A} to E^{5A} is phosphorus,

R^{1A}-R^{4A} are each, independently of one another, hydrogen, C_1-C_{20}-alkyl, C_2-C_{20}-alkenyl, C_6-C_{20}-aryl, alkylaryl having from 1 to 10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part, NR^{6A}_2, $N(SiR^{6A}_3)_2$, OR^{6A}, $OSiR^{6A}_3$, SiR^{6A}_3, where the organic radicals R^{1A}-R^{4A} may also be substituted by halogens and two vicinal radicals R^{1A}-R^{4A} may also be joined to form a five- or six-membered ring, and/or two vicinal radicals R^{1A}-R^{4A} may be joined to form a heterocycle containing at least one atom from the group consisting of N, P, O and S,

R^{6A} are each, independently of one another, hydrogen, C_1-C_{20}-alkyl, C_2-C_{20}-alkenyl, C_6-C_{20}-aryl, alkylaryl having from 1 to 10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part and two geminal radicals R^{6A} may also be joined to form a five- or six-membered ring.

A is an unsubstituted, substituted or fused, heteroaromatic ring system,

Z is a bridge between A and Cp and is selected from the group consisting of



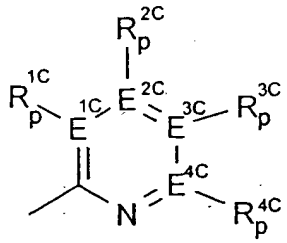
where

L^{1B}-L^{3B} are each, independently of one another, carbon or silicon,

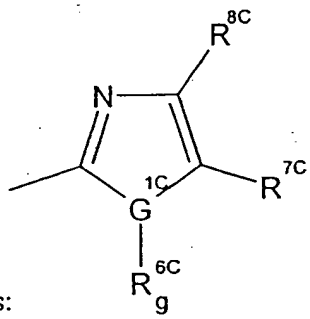
R^{1B}-R^{6B} are each, independently of one another, hydrogen, C_1-C_{20}-alkyl, C_2-C_{20}-alkenyl, C_6-C_{20}-aryl, alkylaryl having from 1 to 10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part or SiR^{7B}_3, where the organic radicals R^{1B}-R^{6B} may also be substituted by halogens and two geminal or vicinal radicals R^{1B}-R^{6B} may also be joined to form a five- or six-membered ring and

R^{7B} are each, independently of one another, hydrogen, C_1-C_{20}-alkyl, C_2-C_{20}-alkenyl, C_6-C_{20}-aryl or alkylaryl having from 1 to 10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part and two radicals R^{7B} may also be joined to form a five- or six-membered ring.

5. (currently amended) A monocyclopentadienyl complex as claimed in ~~any of claims~~ claim 1 ~~to 4~~, wherein A has the formula (IIIa) or (IIIb):



(IIIa)



(IIIb)

where the variables have the following meanings:

E^{1C}-E^{4C} are each carbon or nitrogen,

R^{1C}-R^{4C} are each, independently of one another, hydrogen, C_1-C_{20}-alkyl, C_2-C_{20}-alkenyl, C_6-C_{20}-aryl, alkylaryl having from 1 to 10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part or SiR^{5C}_3, where the organic radicals R^{1C}-R^{4C} may also be substituted by halogens or nitrogen and further C_1-C_{20}-alkyl, C_2-C_{20}-alkenyl, C_6-C_{20}-aryl, alkylaryl having from 1 to 10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part or SiR^{5C}_3 groups and two vincinal radicals R^{1C}-R^{4C} or R^{1C} and Z may also be joined to form a five- or six-membered ring and

R^{5C} are each, independently of one another, hydrogen, C_1-C_{20}-alkyl, C_2-C_{20}-alkenyl, C_6-C_{20}-aryl or alkylaryl having from 1 to 10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part and two radicals

R^{5C} may also be joined to form a five- or six-membered ring and

p is 0 when E^{1C}-E^{4C} is nitrogen and 1 when E^{1C}-E^{4C} is carbon,

G^{1C} is nitrogen, phosphorus, sulfur or oxygen,

R^{6C}-R^{8C} are each, independently of one another, hydrogen, C_1-C_{20}-alkyl, C_2-C_{20}-alkenyl, C_6-C_{20}-aryl, alkylaryl having from 1 to 10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part or SiR^{9C}_3, where the organic radicals R^{6C}-R^{8C} may also be substituted by halogens or nitrogen and further C_1-C_{20}-alkyl, C_2-C_{20}-alkenyl, C_6-C_{20}-aryl, alkylaryl having from 1 to 10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part or SiR^{9C}_3 groups and two vincinal radicals R^{6C}-R^{8C} or R^{6C} and Z may also be joined to form a 5- or 6-membered ring and

R^{9C} are each, independently of one another, hydrogen, C_1-C_{20}-alkyl, C_2-C_{20}-alkenyl, C_6-C_{20}-aryl or alkylaryl having from 1 to 10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part and two radicals R^{9C} may also be joined to form a five- or six-membered ring and

g is 0 when G^{1C} is sulfur or oxygen and 1 when G^{1C} is nitrogen or phosphorus.

6. (currently amended) A monocyclopentadienyl complex as claimed in ~~any of claims~~ claim 1 ~~to 5~~, wherein Z is selected from the group consisting of -$C(R^{1B}R^{2B})$-$Si(R^{3B}R^{4B})$-, –CH_2-$C(R^{3B}R^{4B})$- and 1,2-phenylene.

7. (currently amended) A catalyst system for olefin polymerization comprising

A) at least one monocyclopentadienyl complex as claimed in ~~claims~~ claim 1 ~~to 6~~ ,

B) optionally, an organic or inorganic support,

C) optionally, one or more activating compounds,

D) optionally, further catalysts suitable for olefin polymerization and

E) optionally, one or more metal compounds containing a metal of group 1, 2 or

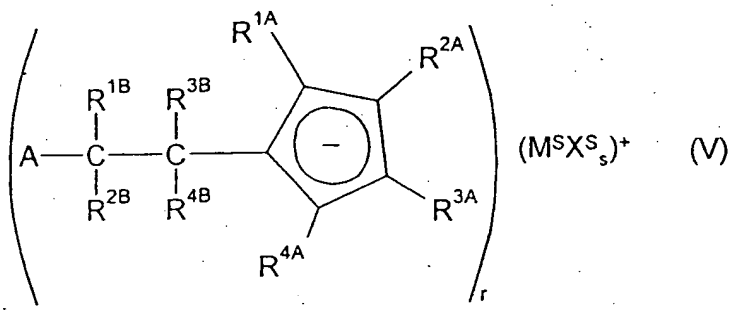
13 of the Periodic Table.

8. (original) A prepolymerized catalyst system comprising a catalyst system as claimed in claim 7 and one or more linear C2-C10-1-alkenes polymerized onto it in a mass ratio of from 1:0.1 to 1:1 000 based on the catalyst system.

9. (canceled)

10. (currently amended) A process for preparing polyolefins by polymerization or copolymerization of olefins in the presence of a catalyst system as claimed in claim 7 ~~or 8~~.

11. (original) A process for preparing cyclopentadienyl systems of the formula (V):



where the variables have the following meanings:

R^{1A}-R^{4A} are each, independently of one another, hydrogen, C_1-C_{20}-alkyl, C_2-C_{20}-alkenyl, C_6-C_{20}-aryl, alkylaryl having from 1 to 10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part, NR^{6A}_2, $N(SiR^{6A}_3)_2$, OR^{6A}, $OSiR^{6A}_3$, SiR^{6A}_3, where the organic radicals R^{1A}-R^{4A} may also be substituted by halogens and two vicinal radicals R^{1A}-R^{4A} may also be joined to form a five- or six-membered ring, and/or two vicinal radicals R^{1A}-R^{4A} are joined to form a heterocycle which contains at least one atom from the group consisting of N, P, O and S.

R^{6A} are each, independently of one another, hydrogen, C_1-C_{20}-alkyl, C_2-C_{20}-alkenyl, C_6-C_{20}-aryl, alkylaryl having from 1 to 10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part and two geminal radicals R^{6A} may also be joined to form a five- or six-membered ring,

A is an unsubstituted, substituted or fused, heteroaromatic ring system,

R^{1B}-R^{4B} are each, independently of one another, hydrogen, C_1-C_{20}-alkyl, C_2-C_{20}-alkenyl, C_6-C_{20}-aryl, alkylaryl having from 1 to 10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part or SiR^{7B}_3, where the organic radicals R^{1B}-R^{4B} may also be substituted by halogens and two geminal vicinal radicals R^{1B}-R^{4B} may also be joined to form a five- or six-membered ring and

R^{7B} are each, independently of one another, hydrogen, C_1-C_{20}-alkyl, C_2-C_{20}-alkenyl, C_6-C_{20}-aryl or alkylaryl having from 1 to 10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part and two radicals R^{7B} may also be joined to form a five- or six-membered ring,

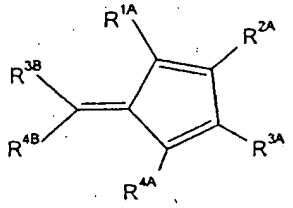
M^S a metal of group 1, 2 or 3 of the Periodic Table of the Elements,

X^S are each, independently of one another, fluorine, chlorine, bromine, iodine, hydrogen, C_1-C_{10}-alkyl, C_2-C_{10}-alkenyl, C_6-C_{20}-aryl, alkylaryl having 1-10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part, NR^1R^2, OR^1, SR^1, SO_3R^1, $OC(O)R^1$, CN, SCN, β-diketonate, CO, BF_4^-, PF_6^- or a bulky noncoordinating anion and

s 0, 1 or 2,

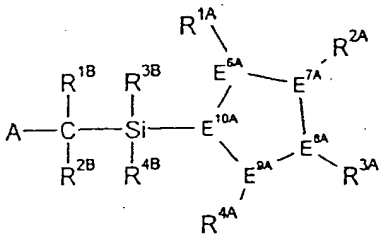
r 1 or 2, with the proviso that s + r is the oxidation state of M^S – 1,

which comprises reacting $(A\text{-}CR^{1B}R^{2B})_r(M^SX^S_s)^+$ with a fulvene of the formula (VI)



(VI)

12. (original) A process for preparing cyclopentadienyl systems of the formula (VIII):



(VIII)

where the variables have the following meanings:

E^{6A}-E^{10A} are each carbon or not more than one E^{6A} to E^{10A} is phosphorus, where four adjacent E^{6A}-E^{10A} form a conjugated diene system and the remaining E^{6A}-E^{10A} additionally bears a hydrogen atom,

R^{1A}-R^{4A} are each, independently of one another, hydrogen, C_1-C_{20}-alkyl, C_2-C_{20}-alkenyl, C_6-C_{20}-aryl, alkylaryl having from 1 to 10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part, NR^{6A}_2, $N(SiR^{6A}_3)_2$, OR^{6A}, $OSiR^{6A}_3$, SiR^{6A}_3, where the organic radicals R^{1A}-R^{4A} may also be substituted by halogens and two vicinal radicals R^{1A}-R^{4A} may also be joined to form a five- or six-membered ring, and/or two vicinal radicals R^{1A}-R^{4A} are joined to form a heterocycle which contains at least one atom from the group consisting of N, P, O and S,

R^{6A} are each, independently of one another, hydrogen, C_1-C_{20}-alkyl, C_2-C_{20}-alkenyl, C_6-C_{20}-aryl, alkylaryl having from 1 to 10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part and two geminal radicals R^{6A} may also be joined to form a five- or six-membered ring,

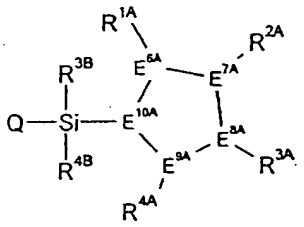
A is an unsubstituted, substituted or fused, heteroaromatic ring system,

R^{1B}-R^{4B} are each, independently of one another, hydrogen, C_1-C_{20}-alkyl, C_2-C_{20}-alkenyl, C_6-C_{20}-aryl, alkylaryl having from 1 to 10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part or SiR^{7B}_3, where the organic radicals R^{1B}-R^{4B} may also be substituted by halogens and two geminal or vicinal radicals R^{1B}-R^{4B} may also be joined to form a five- or six-membered ring, and

R^{7B} are each, independently of one another, hydrogen, C_1-C_{20}-alkyl, C_2-C_{20}-alkenyl, C_6-C_{20}-aryl or alkylaryl having from 1 to 10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part and two radicals

R^{7B} may also be joined to form a five- or six-membered ring,

which comprises reacting $(A\text{-}CR^{1B}R^{2B-})_r(M^SX^S{}_S)^+$ with a cyclopentadienyl system of the formula (IX)



(IX)

where the variables are as defined above and

Q is a leaving group.